31. FAMILY ERIOCAULACEAE IN KOLHAPUR AND ITS ENVIRONS

As a part of their studies on the revision of the flowering plant families of Kolhapur and its environs, an account of Commelinaceae was given by Kulkarni & Mudgal (1970). This note is in continuation of the series and deals with the family Eriocaulaceae of the region.

The identification of the species listed here is based upon the study of several fresh collections made from different localities of this region. The nomenclatural changes of the taxa identified were confirmed by consulting H. N. Moldenke of U.S.A. The herbarium specimens are deposited in the herbarium of Shivaji University, Botany Department, Kolhapur.

Key to the species of *Eriocaulon* from Kolhapur

Plants of running water ; stem well developed
- Leaves 3-4 mm wide ; involucre black..... *E. breviscapum*
- Leaves less than 2·5 mm wide ; involucre pale..... *E. dalzellii*

Plants terrestrial or of marshes ; stem very short or absent
- Sepals crested
  - Female sepals alone crested
    - Bracts stellately spreading..... *E. stellulatum*
    - Bracts not stellately spreading
      - All the female sepals equally crested..... *E. margaretae*
      - Crest well developed on only two female sepals..... *E. elenorae*
  - Both male and female sepals crested
    - Leaf apex rounded and cuspidate ; involucral bracts glabrous.... *E. cuspidatum*
    - Leaf apex obtusely acuminate ; involucral bracts dorsally white powdery pubescent..... *E. vanheurckii*
- Sepals noncrested
  - Involucral bracts projecting above the head
    - Petals glandular..... *E. xeranthemum*
    - Petals eglandular
      - Third female sepal oblanceolate, flat, equalling the others in size.... ..... *E. dianae*
      - Third female sepal linear, smaller than the others..... ..... *E. dianae* var. *longibracteatum*
  - Involucral bracts not projecting above the head
    - Anthers white or yellow
      - Female petals absent, sepals reduced to bunch of hairs..... *E. cinereum*
      - Female sepals and petals both present..... *E. ritchieanum*
    - Anthers white when young but becoming blackish at maturity ; plants tuberiferous..... *Eriocaulon* sp.
    - Anthers black
      - Male and female sepals two
        - Female petals absent..... *E. achiton*
        - Female petals present
          - Involucral bracts glabrous..... *E. duthiei*

Involucral bracts densely covered with white hairs.....*E. sedgwickii*
Male and female sepals three
One male petal larger and extruded beyond its floral bract.....
.....*E. polycephalum*
Male petals equal or subequal, none extruded beyond the floral bract
Leaves turning red on drying.....*E. quinquangulare*
Leaves not turning red on drying
Heads truncated by the very horizontal involucre, pollen-grains pantoporate.....*E. truncatum*

Heads not truncated ; pollen-grains spiraperaturate
Female sepals with dense tuft of hairs on the back towards apex.....
.....*E. wightianum*
Female sepals glabrescent
Heads conical.....*E. conicum*
Heads globose
receptacle glabrous.....*E. nepalense*
receptacle villous.....*E. collinum*

The family is represented by 23 taxa belonging to the genus *Eriocaulon*. They fall into five out of eight sections by Fyson (1919) of this genus. The numbers given in brackets refer to herbarium specimens deposited in the University herbarium.

Section Simplices (a)

E. nepalense Prescott. Abundant in paddy fields of Kolhapur (315) and Panhala (530) during monsoon. August-September.

E. truncatum Hamilt. Grows on moist rocky soils and in paddy fields along sea shore of Vengurla (1002). October-November.

E. duthiei Hook. f. Pretty common in marshes near Lingamala, Mahabaleshwar (1011). September-October.

E. xeranthemum Mart. Grows on moist soil and in paddy fields. Radhanagari (730), Amboli (901) and Savantwadi (1005). September-November.

Simplices (b)

E. quinquangulare L. Common along the margins of puddles and in marshes. Amba (850). December-January.

E. dianae Fyson. Most common member of the marshes of Kolhapur (316), Kagal lake (317) and Radhanagari (731). August-September.

E. dianae var. **longibracteatum** Fyson. Moist soils of Kolhapur (318) ; often grows in association with *E. dianae*. August-September.

E. conicum (Fyson) Fischer. On the surface of moist rocks. Kolhapur (319) and Panhala (531). August-September.

E. collinum Hook. f. Marshes of Kolhapur (320), Kagal lake (321) and Vadanige lake (322). September-October.

E. achiton Korn. Grows on moist lateritic soils. Panhala (532), Radhanagari (732) and Amboli (909). August-September.

E. sedgwickii Fyson. Most common in grass lands near Gaganbavada (686, 687). August-September.

Hirsutae

E. wightianum Mart. An elegant species ; very common in muddy soils and along streams. Often grows intermixed with *E. stellulatum*. Radhanagari (733-735), Amboli (902-904) and Bilashi (741). September-October.

Anisopetalae

E. polycephalum Hook. f. (*E. longicuspis* var. *polycephalum* Fyson). Along the margins of puddles mixed with *E. cuspidatum* on the way to Dhamapur from Malvan (1010). August-September.

Cristato-sepalae

E. margaretae Fyson. Along sandy beds of the lake at Panhala (534). Common in moist and marshy localities of Kolhapur (323), Panhala (533) and Radhanagari (736). August-September.

E. elenorae Fyson. Grows in moist lateritic soils of Panhala (535), Radhanagari (737) and Amboli (1000). September-October.

E. stellulatum Korn. In marshy areas and along the streams. Radhanagari (738), Amboli (905) and Bilashi (742). September-October.

E. cuspidatum Dalz. In moist forest soils at Anandvahal (1011) ; along the margins of puddles on the way to Dhamapur (1013) ; most common in rice fields at Malvan (1014). September-October.

E. vanheurckii Muell-Arg. On moist rocks along the streams. Amboli (907). September-October.

Leucantherae

E. cinereum R. Br. (*E. sieboldianum* Sieb. and Zucc.) Common on moist rocks and lateritic soils in Panhala (536) and Phonda ghats (740). September-October.

E. ritchieanum Ruhl. Grows intermixed with *Isoetes* spp. in muddy soil along the margins of the pond in Panchgani (1010). September-October.

E. breviscapum Korn. In and along the streams at Anmod (1019). January-April.

E. dalzellii Korn. (*E. rivulare* Dalz.) In running water at Amboli (908) and Pali (56). September-October.

Eriocaulon sp. Tuberiferous species in muddy places along the margins of puddles often in association with *Isoetes* spp. Panhala (537) and Radhanagari (739). July-September.

Though *E. margaretae* is described to have glabrous receptacles by Fyson (1921), the populations of this species collected from Panhala and Radhanagari have distinctly villous receptacles whereas those collected from Kolhapur have glabrous receptacles. It appears that the development of indumentum which is often taken to be a sectional or subsectional character in the classification of this genus is markedly affected by environmental factors as suggested by Fischer (1928).

A population of *E. stellulatum* collected from Amboli differed from rest of the collections of this species in its diminutive habit and in the foliar epidermis which had wider cells with conspicuously wavy walls. These differences do not appear to be ecological since the plants belonging to *E. stellulatum* proper were found growing mixed-up with the plants of this variant in the same habitat at Amboli. Further studies on the taxonomic status of this variant with respect to *E. stellulatum* proper are in progress.

The detailed examination of the herbarium specimens of *E. ritchieanum* represented in different regional herbaria of Botanical survey of India suggest that the tuberiferous plants formerly described by the authors (1970) as belonging to *E. ritchieanum*, appear to be distinct from this species in some of their floral features also. Hence for the time being they have been listed separately here.

In the genus *Eriocaulon* each scape as a rule bears a single terminal head. During the present study tendency to form branched heads was noticed in *E. margaretae*, *E. dalzellii* and *E. cuspidatum*. In the former two species branching was observed as a rare phenomenon whereas the population of *E. cuspidatum* collected from Anandvahal near Malvan showed maximum frequency of branching. In this species several peduncles of each plant were found to end in a bunch of 3-5 umbellately arranged heads instead of a single one.

Development of tetra- and hexacarpellate gynoecia was noticed in a few plants of *E. margaretae* and *E. conicum* respectively. These observations are interesting since the occurrence of more than 3 carpels in a gynoecium is unknown in this entire family.

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References

Fischer, C. E. C. (1928) : Eriocaulaceae in Flora of the Presidency of Madras. III : Reprinted by Botanical Survey of India, Calcutta.

Fyson, P. F. (1919) : Indian species of *Eriocaulon*. *Journ. Indian Bot. Soc.* **1** : 49-53.

Fyson, P. F. (1921) : Indian species of *Eriocaulon*. ibid. **2** : 307-320.

Kulkarni, A. R. & Desai, M. H. (1970) : Tubers in *Eriocaulon ritchieanum* Ruhl. *J. Bombay nat. Hist. Soc.* **67** : 134-135.

32. DISTRIBUTION OF *GELIDIELLA ACEROSA* (FORSKÅL) FELDMANN & HAMEL

(*With a map*)

Among the four species of *Gelidiella* reported from Indian coasts, *G. myrioclada* Boergs and *Gelidiella* sp. are endemic, and *Gelidiella bornetii* is limited in distribution to India and Kei islands. Hence, *Gelidiella acerosa* (Forskål) Feldmann et Hamel, which is a widely distributed species, is considered here to understand its distributional pattern in the world.

During the monographic treatment of *Gelidiella acerosa*, available along the west coast of India and south-east coast of Madras, the author had an opportunity to study the various available species of this genus in the world deposited in the herbarium collections maintained at Madras University, Madras. Based on the study of these herbarium specimens, an attempt is made to know the extent to which the distribution of *Gelidiella acerosa* agrees with the previously recognised marine algal provinces (Fritsch 1945 ; Silva 1957).

It can be seen from the map that this alga spans the equator and is represented in the three oceans—Indian, Pacific and Atlantic.

In the Indian ocean, its north-western limit is in the Red sea and Iranian Gulf (Boergesen 1939), while in the west it has been reported only from Mauritius (Boergesen 1950). In the north, it occurs along the